

## 3.4

## General Landscaping Principles

Good general landscaping practices increase the ecological value of landscapes while reducing energy use, minimizing or eliminating the use of harmful pesticides, minimizing the use of potable water, and decreasing stormwater runoff. Recommended practices include choosing appropriate plantings, responsibly managing water on the site—both water we add and rainfall—and choosing appropriate materials for landscape construction. Through good landscaping we can complement natural ecosystems, preserve the inherent beauty and functionality of a site, maintain and enhance wetlands and natural water flows, help building occupants appreciate nature, and educate visitors about the value of responsible landscape management. Another important benefit of “greener” landscaping can be the reduction of energy use—both directly in the maintenance program (less mowing, for example) and indirectly by reducing the “heat island effect” (regional or localized warming due to paving and other surfaces that heat up), which drives up cooling energy use.

### Opportunities

Opportunities to improve landscaping practices exist in virtually any facility with outdoor grounds. Improvements can be implemented at any time, though many are seasonal. Some landscape construction measures are most easily included during initial development of a facility.

### Technical Information

All landscapes change, grow, and evolve in a process of succession. By sensitively working with these natural dynamics, good landscaping can provide economy, efficiency, and satisfaction for the workforce.

Good general landscape principles consider site functions for humans and wildlife and anticipate cycles of use throughout the day, week, and year. They take into consideration extremes of climate, annual solar angles with patterns of light and shade, annual direction and intensity of breezes, even seasonal color of flower and leaf. A good landscape plan takes advantage of the aesthetics of site orientation and helps building occupants “celebrate” nature (which some experts suggest may have a beneficial effect on productivity in the workplace).

### PLANT MATERIALS

**Appropriate plant selection** means “using the right plant in the right place.” Native plants (or others well-adapted to local conditions) should be used whenever possible. Plant growth rate, size at maturity, life span, brittleness, and requirements for light, water, and soil pH are important factors in selecting plants—along with color, texture, scent, and seasonal characteristics. Matching plant requirements with site realities, and correctly placing appropriate plants, helps avoid expensive and time-consuming problems. Thoughtful selection and siting of trees, shrubs, and groundcovers to provide shade and lower ambient air temperature can reduce air conditioning energy use by 5–20%. The use of native and noninvasive naturalized plant materials can reduce maintenance demands. Selection of plant materials for low water consumption, as well as for disease and pest resistance, can contribute significantly to an environmentally responsible landscape.

**Allergy potential** is an important consideration with plant selection. Some plants produce copious pollen that affects building occupants who have allergies. As many as 30% of adults and 40% of children suffer from allergic rhinitis (nasal congestion and itchy eyes commonly called hay fever), a rate that has increased dramatically in recent years. Some plants are far more allergenic than others, and even within a particular species there may be big differences. With dioecious plants (separate male and female plants), for example, it is only the males that produce pollen; in cities it has been common practice to plant only male trees, because fruits are not produced that have to be cleaned up—but this exacerbates allergy problems. The Ogren Plant Allergy Scale (OPALS) has recently been published to provide guidance on plant selection—see the references in this section, and see *Section 3.6 – Plantings in the Sustainable Landscape* for more information.

**Turf grass** should be limited to recreational areas and not become the default landscape. This allows major reductions in water, chemicals, maintenance energy, pollution, noise, and labor. Where turf is used, species and cultivar selection should consider the local climate and growing conditions. Alternatives to conventional turf include low-growing ground covers, wildflower meadows, prairie ecosystems, and decorative mulches.

### WATER USE

**Efficient irrigation** is accomplished by grouping plants with similar water needs. Design irrigation systems to avoid overwatering by using ultra-low-volume distribution devices. Irrigate after on-site inspection or electronic sensing of moisture requirements, rather

than by schedule. Water requirements vary greatly by season. As the landscape matures, less irrigation is required—especially when native or well-adapted plants and thick mulches are used. Automatic irrigation controllers should have rain switches that override the “on” signal when sufficient rain has fallen or soils are moist.

**Reclaimed wastewater**, sometimes called Irrigation Quality or IQ water, is another possible source of water for irrigation. It is often available at attractive rates from some water utilities. It must be scrupulously isolated from potable water distribution, and all IQ hose bibs must be clearly marked as “nonpotable.” See *Section 6.5 – Reclaimed Water*.

**Graywater** is untreated wastewater generated within the facility from shower and bath, laundry, and bathroom sinks (not from toilets, urinals, kitchen sinks, or dishwashers). In some parts of the country, graywater can be used for below-ground irrigation. Because pathogens may be present, it should never be used for above-ground irrigation or on fruits and vegetables for human consumption. See *Section 6.6 – Graywater Collection and Use*.

**Rainwater harvesting** can often satisfy all landscape water needs while helping to reduce stormwater runoff. Careful planning is needed that considers anticipated water needs, rainfall patterns, storage requirements, maintenance of water quality, and means of distribution. See *Section 6.7 – Rainwater Harvesting*.

**Watershed management** for water quality and habitat protection/improvement should be carefully addressed on most sites. Opportunities include groundwater recharge through stormwater infiltration, grassy swales to filter and purify runoff from roads and parking lots, and responsible treatment of on-site-generated wastewater through advanced purification technologies and constructed wetlands. See *Sections 3.5 – Stormwater Management* and *6.8 – On-Site Wastewater Treatment Systems*.

## LANDSCAPE MATERIALS AND STRUCTURES

**To pave surfaces in landscaped areas**, use loose-set masonry units, flagstones, gravel, turf block, “geowebs” (flexible or rigid synthetic grid structures) planted with grass or groundcovers, crushed shells, mosaics of reused concrete slab, and forest-derived materials. A bedding of crushed, recycled concrete improves drainage and may serve as a useful application for an otherwise difficult-to-dispose-of material. Porous paving with specially formulated concrete or asphalt is appropriate for some applications. With alternatives

to pavement, consider other issues, such as the fact that crushed stone and pebble surfaces do not contribute organic matter to soils, that crushed shell surfaces may raise soil pH, and that some light-colored surfaces might reflect sunlight onto nearby plants and thus injure them.

**Mulches hold soil moisture**, reduce weed growth, slow erosion, build soil texture, increase root density by keeping soil cooler in summer and warmer in winter, and feed important soil microorganisms (which, in turn, buffer soil pH). Mulches add color, texture, contrast, and definition. They can consist of leaves; grass clippings; shredded wood from site clearing, utility, or commercial sources; pine bark; pine straw; nut hulls; or sawdust. Under deciduous trees, leaf litter eventually becomes mulch if left undisturbed. Use chipped prunings with caution—some fungi and diseases can be spread in dead wood. Cypress mulch should be avoided because its harvest depletes an important tree population.

Recycled-plastic lumber products provide an increasingly attractive alternative to pressure-treated wood and naturally rot-resistant wood from old-growth trees that are in limited supply. Both 100% recycled-plastic lumber products and recycled-plastic-wood-fiber composite lumber products are available.

## References

Thompson, William, and Kim Sorvig, *Sustainable Landscape Construction: A Guide to Green Building Outdoors*, Island Press, Washington, DC, 2000.

Ogren, Thomas, *Allergy-Free Gardening: The Revolutionary Guide to Healthy Landscaping*, Ten Speed Press, Berkeley, CA, 2000.

*Xeriscape—A Guide to Developing a Water-Wise Landscape*, Georgia Cooperative Extension Service, Atlanta, GA, 1992.

## Contacts

For local consulting on landscape and soils issues, contact your local county cooperative extension service or a local office of the Natural Resources Conservation Service.

American Society of Landscape Architects, 4401 Connecticut Avenue, NW, 5th Floor, Washington, DC 20008; (202) 686-2752; [www.asla.org](http://www.asla.org).